REMARKS

The present application was filed on October 27, 2000 with claims 1-22. In the outstanding Office Action dated April 25, 2002, the Examiner rejected each of claims 1-22 under 35 U.S.C. §103(a) as being unpatentable over an article by Fleming et al. entitled "Generalized Multiple Descriptive Vector Quantization," (hereinafter "Fleming") in view of one or more other references or allegedly well-known but unspecified prior art.

In this response, Applicants amend dependent claims 4 and 15 to correct a minor typographical error, and traverse the §103(a) rejections. Applicants respectfully request reconsideration of the present application in view of the following remarks.

Applicants initially note that MPEP §706.02 specifically states as follows with regard to the burden that the Examiner must meet in order to establish a proper §103(a) rejection:

> To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art and not based on applicant's disclosure. *In re Vaeck,* 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Applicants respectfully submit that the Examiner has not established a *prima facie* case of obviousness in the present §103(a) rejections. More particularly, the Examiner has failed to meet one or more of the above-noted basic criteria, for the reasons outlined below.

The present invention as set forth in independent claims 1 and 12 is directed to a signal processing method and apparatus, respectively, in which a signal is encoded in a multiple description decoder which generates a plurality of different descriptions of a given portion of the signal. These claims also include substantially the following limitations:

(i) the different descriptions of the given portion of the signal are arranged into packets such that at least a first description of the given portion is placed in a first packet and a second description of the given portion is placed in a second packet; and

(ii) the packets are transmitted using a frequency hopping modulator, wherein a hopping rate of the modulator is configured based at least in part on a number of descriptions generated for each of a plurality of different portions of the signal.

An illustrative embodiment of the invention falling within the above-noted limitations of claims 1 and 12 is described in the specification, at page 9, lines 11-24, as follows, with emphasis supplied:

> As noted previously, in the illustrative embodiment as shown in FIG. 2, the frequency hopping modulator 125 periodically hops in frequency. One possible single description implementation of the modulator 125 in a cordless telephone application hops among 25 different frequencies $\{f_n\}$, where $n = 1, 2, \ldots 25$, using a hopping period of 125 milliseconds. Each 5 millisecond speech segment in such an application is thus sent in a different packet on a different frequency. The modulator 125 thus cycles through the 25 hopping frequencies in each 125 millisecond hopping period in the single description case.
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> The present invention provides a multiple description interleaving strategy that involves configuring the frequency hopping rate of the modulator 125 for transmission of the previously-described multiple descriptions. In order to avoid an increase in the transmission delay, the frequency hopping rate used for transmission of the multiple descriptions in the illustrative embodiment is doubled relative to the hopping rate used for the above-noted single description implementation. Consecutive input samples are separated into groups of 20 samples. A given packet is generated using the samples associated with a first description of a current 20-sample group and the samples associated with a second description of the previous 20-sample group. Each packet is still transmitted using a particular one of the 25 frequencies, but the packet is configured in the manner described above to include a first description of a current group of samples and a second description of a previous group of samples. In other words, the first description of the current 20-sample group is sent in the

current packet, and the second description is delayed and sent with the next packet. The frequency hopping rate is doubled, such that the frequency hopping period for the illustrative embodiment is reduced to 62.5 milliseconds.

The Examiner in formulating the §103(a) rejection of independent claims 1 and 12 argues that the claimed invention is obvious even though at least limitation (ii) above is not explicitly disclosed by either Fleming or U.S. Patent No. 5,048,057 (hereinafter "Saleh").

Applicants submit that there is no motivation to combine Fleming and Saleh in the manner urged by the Examiner. For example, there is no mention in Fleming of a frequency hopping modulator or the desirability of using such a modulator for transmission of multiple descriptions in the manner claimed. Similarly, there is no mention in Saleh regarding multiple descriptions or their use in conjunction with a frequency hopping modulator in the manner claimed. The Examiner has therefore failed to establish the first of the criteria specified in MPEP §706.02, that is, has failed to identify some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the references or to combine the reference teachings. The Examiner instead relies upon impermissible hindsight to reconstruct the present invention from unrelated references.

Moreover, even if one were to assume, for purposes of argument, that the Fleming and Saleh references are combinable in the manner urged by the Examiner, the combination would fail to meet at least limitation (ii) above.

The Examiner argues that column 1, lines 45-65 of Saleh read on limitation (ii) above, despite the fact that Saleh makes no mention of multiple descriptions and multiple descriptions are a requirement of the limitation. The cited portion of Saleh teaches nothing beyond conventional frequency-hopping modulation. There is no discussion or suggestion regarding limitation (ii) of the claimed invention, in which the frequency hopping rate of the modulator is configured based on the number of descriptions generated in multiple description encoding. The combination proposed by the Examiner therefore fails to meet certain limitations of claims 1 and 12, and therefore fails to meet the third and final criterion specified in MPEP §706.02.

To summarize, independent claims 1 and 12 in limitation (ii) above require that the hopping rate of the modulator be configured based on the number of descriptions generated in a multiple description encoding process. The Examiner has combined a pair of references, one a multiple description reference with no mention of frequency hopping and the other a frequency hopping reference with no mention of multiple descriptions, in an attempt to recreate the present invention based on the benefit of hindsight and without identifying a cogent motivation for the combination. Moreover, even if one were to assume for purposes of argument that the references are combinable, the combination fails to meet at least limitation (ii) above.

Dependent claims 2-11 and 13-22 are believed allowable for at least the reasons identified above with regard to their respective independent claims. The §103(a) rejections thereof are believed to be improper and should be withdrawn. In addition, one or more of these dependent claims are believed to define additional patentable subject matter beyond that specified in their respective independent claims. For example, dependent claims 8, 9, 10, 19, 20 and 21 incorporate particular limitations of the two-description example in the illustrative embodiment of the invention cited above, and are not taught or suggested by the cited references. The Examiner in rejecting these claims does not rely on specific teachings from the references, but instead upon subjective belief, which as noted above fails to meet the criteria for a proper §103(a) rejection.

Attached hereto is a marked-up version of the changes made to the claims by the present Amendment.

In view of the above, Applicants believe that claims 1-22 are in condition for allowance, and respectfully request the withdrawal of the §103(a) rejections.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS

4. (Amended) The method of claim 1 wherein each of the portions of the signal [correspond] corresponds to a designated segment of the signal having a particular time duration.

15. (Amended) The apparatus of claim 12 wherein each of the portions of the signal [correspond] corresponds to a designated segment of the signal having a particular time duration.